

Abstract of the Invention:

A method and system for data modeling that incorporates the advantages of both traditional response surface methodology (RSM) and neural networks is disclosed. The invention partitions the parameters into a first set of s simple parameters, where observable data are expressible as low order polynomials, and c complex parameters that reflect more complicated variation of the observed data. Variation of the data with the simple parameters is modeled using polynomials; and variation of the data with the complex parameters at each vertex is analyzed using a neural network. Variations with the simple parameters and with the complex parameters are expressed using a first sequence of shape functions and a second sequence of neural network functions. The first and second sequences are multiplicatively combined to form a composite response surface, dependent upon the parameter values, that can be used to identify an accurate model.